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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,808	07/22/2003	David Alan Bailey	ROC920030220US1	6643
46296 7590 12/26/2007 MARTIN & ASSOCIATES, LLC P.O. BOX 548 CARTHAGE, MO 64836-0548			EXAMINER DOAN, DUC T	
			ART UNIT 2188	PAPER NUMBER
			MAIL DATE 12/26/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/624,808

Applicant(s)

BAILEY ET AL.

Examiner

Duc T. Doan

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4,5,9,10,16,19 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-5,9-10,16,19,22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set for in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/16/2007 has been entered.

Claim 1-24 have been presented for examination in this application, claims 1-3,6-8,11-15,17-18 and 20-21 have been canceled. As the result, claims 4-5,9-10,16,19 and 22-24 are pending in this application.

Claims 4-5,9-10,16,19 and 22-24 are rejected.

Applicant's arguments filed 10/16/2007 have been fully considered but they are not persuasive. Therefore, the rejections from the previous office action are respectfully maintained and restated below,

Claim Objections

Claim 4 is objected to because of the following informalities:

As per claim 4 the terminology "I/O" should not be abbreviated for the initial recital in the claim.

Appropriate correction is required.

U.S.C. 112, first paragraph

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4-5,9-10,16,19 and 22-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, has possession of the claimed invention.

As in claims 4-5,9-10,16,19, the claims recite "identified I/O". Examiner cannot find any paragraphs in the specification that explains how "I/O" is identified and what components constituted "I/O".

Examiner asks Applicant to show support above issue(s).

U.S.C. 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4-5, 9, 10, 16, 19, and 22-24
Claims ¹²⁻²⁴⁰⁷ are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As in claims 4-5,9-10,16,19 and 22-24, the recitation "I/O" renders the claims indefinite as one of ordinary skill in the art would be unable to ascertain the metes and bounds of this claim limitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-5,9-10,16,19 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Day et al (US Pub 2003/0084030) in view of Tarui et al (US Pub 2002/0112102), and further in view of Kaneko (2003/0163641).

As in claim 4, Day discloses an apparatus comprising: at least one processor (Day's Fig 1: #101A-H CPU); a memory coupled to the at least one processor (Day's Fig 1: #102 memory); a plurality of logical partitions defined on the apparatus (Day's Fig 2: #206B, #205B, #204B a hypervisor partition represented by user application code modules, operating system code modules such as high level OS and OS kernel),
a partition manager residing in the memory and executed by the at least one processor (Day's Fig 2: #203, #202 hypervisor management code and based hypervisor code PLIC executed by processor in memory, corresponding to the claim's partition manager),
the partition manager managing the plurality of logical partitions and executing separately from the plurality of logical partitions (Day's paragraph 28,37 discloses the partition management

code (Fig 2: #203, #202 hypervisor management code and based hyper visor code PLIC) executes separately from logical partition to manage resources in plurality of logical partitions), Day does not expressly disclose the claim's detail of I/O reconfiguration mechanism. However, Tarui discloses the partition manager (Tarui's paragraph 59 lines 1-2, partition control program such as hypervisor) comprising

an I/O reconfiguration mechanism that reconfigures identified I/O (Tarui's paragraph 53 reconfiguring I/O resources that being shared among logical partitions); and a logical partition suspend/resume mechanism that suspends at least one of the plurality of logical partitions before the I/O reconfiguration mechanism reconfigures the identified I/O by inhibiting dispatch of tasks to the at least one logic partition (Tarui's paragraph 84 discloses the partition control program instructs the OS of the current partitions (i.e the partitions whose allocations of resources are being changed, paragraph 83) to stop using the resources, thus obviously no more i/o tasks are issued in these current partitions (i.e corresponding to the claim's suspending logical partition and inhibit dispatch of tasks mechanism);

and waiting until all pending tasks in the at least one logical partition are complete (Tarui's Fig 1: #101 discloses pending tasks in logical partition are flushed by the I/O adapter circuitry until it completed, when no more pending I/O request and byte counter value is zero, see Tarui's paragraphs 65, 67), and that resumes all suspended logical partitions after the I/O reconfiguration mechanism reconfigures the identified I/O by enable dispatching of tasks to the at least one logical partition (Tarui's paragraph 83 and 84 clearly teaches that after reconfiguration of i/o resources, the partitions are permitted/resumed to use the i/o resources,

see Tarui's paragraph 84 lines 11-16), obviously when the partitions are permitted to use the i/o resource, the i/o tasks will be dispatched to the previously stopped logical partitions.

It would have been obvious to one of ordinary skill in the art at the time of invention to include the partition control program and associating logic as suggested by Tarui in Day's system thereby the reconfiguration of i/o resources can be done dynamically and in an automatic manner (Tarui's paragraph 84 lines 12-16);

Day does not expressly disclose the claim's aspect of ownership of I/O. However, Tarui further discloses the plurality of logical partitions comprising at least one logical partition that owns identified I/O and at least one logical partition that does not own the identified I/O (Tarui's paragraph 53, space sharing allocation allocates each partition with separate I/O resources; It's further noted that each logical partition can own and process its own identified I/O tasks in separate manner, thus a second logical partition would not process the I/O task that has been assigned, owned and identified by a first logical partition);

Day and Tarui do not expressly disclose the claim's aspects of suspends/resumes **all** of the plurality of the logical partitions. However, Kaneko's paragraph 31 discloses a storage subsystem with I/O resources being assigned separately to plurality of the logical partitions. Kaneko further discloses an I/O reconfiguration including **all** of the logical partitions are suspended, the I/O reconfiguration reconfigures the identified I/O by inhibiting dispatch of tasks to **all** of the plurality of logical partition (Kaneko's paragraph 32, the whole system is switch to a disconnect standby mode) and waiting until **all** pending tasks in all of the plurality of logical partitions are completed (Kaneko's paragraph 32 lines 13-14, when the requests from the host have been completely processed), and that resumes all of the plurality of logical partitions

after the I/O reconfiguration mechanism reconfigures the identified I/O by enable dispatching of tasks to **all** of the plurality of logical partition (Kaneko's paragraph 33 discloses when there is no more left requests from the host, the logical partitioning configuring/changing is carried out, and when this step is completed, the system resumes to executing **all** suspended requests and other new dispatching requests). Kaneko's paragraph 24 further teaches that the logical partitioning of resources can be done in a dynamically manner. It would have been obvious to one of ordinary skill in the art at the time of invention to include the logical partitioning method and associating logic as suggested by Kaneko in Day's system modified by Tarui, thereby the reconfiguration of i/o resources can be done easily in a dynamically manner (Kaneko's paragraph 24).

Tarui's paragraph 83 further discloses the circuitry detects identified I/O required reconfiguration (reconfiguration changes for identified I/O tasks required when hot-plugged i/o resources occurring).

Claims 5,9-10,16,19 are rejected based on the same rationale as in claim 4.

As in claim 22, Day discloses an apparatus comprising: at least one processor (Day's Fig 1: #101A-H CPU); a memory coupled to the at least one processor (Day's Fig 1: #102 memory); a plurality of logical partitions defined on the apparatus (Day's Fig 2: #206B, #205B, #204B a hypervisor partition represented by user application code modules, operating system code modules such as high level OS and OS kernel),
a partition manager residing in the memory and executed by the at least one processor (Day's Fig 2: #203, #202 hypervisor management code and based hypervisor code PLIC executed by processor in memory, corresponding to the claim's partition manager),

the partition manager managing the plurality of logical partitions and executing separately from the plurality of logical partitions (Day's paragraph 28,37 discloses the partition management code (Fig 2: #203, #202 hypervisor management code and based hyper visor code PLIC)

executes separately from logical partition to manage resources in plurality of logical partitions),

Day does not expressly disclose the claim's steps associating with the partition manager.

However, Tarui discloses the partition manager (Tarui's paragraph 59 lines 1-2, partition control program such as hypervisor) comprising:

an I/O reconfiguration mechanism that reconfigures identified I/O (Tarui's paragraph 53 reconfiguring I/O resources that being shared among logical partitions/identified tasks); and a logical partition suspend/resume mechanism that suspends at least one of the plurality of logical partitions before the I/O reconfiguration mechanism reconfigures the identified I/O by inhibiting dispatch of tasks to the at least one logic partition (Tarui's paragraph 84 discloses the partition control program instructs the OS of the current partitions (i.e the partitions whose allocations of resources are being changed, paragraph 83) to stop using the resources, thus obviously no more i/o tasks are issued in these current partitions (i.e corresponding to the claim's suspending logical partition and inhibit dispatch of tasks mechanism to i/o resources, thus quiescing i/o resources associating with the tasks being suspended);

and waiting until all pending tasks in the at least one logical partition are complete (Tarui's Fig 1: #101 discloses pending tasks in logical partition are flushed by the I/O adapter circuitry until it completed, when no more pending I/O request and byte counter value is zero, see Tarui's paragraphs 65, 67), and that resumes all suspended logical partitions after the I/O reconfiguration mechanism reconfigures the identified I/O by enable dispatching of tasks to the

at least one logical partition (Tarui's paragraph 83 and 84 clearly teaches that after reconfiguration of i/o resources, the partitions are permitted/resumed to use the i/o resources, see Tarui's paragraph 84 lines 11-16), obviously when the partitions are permitted to use the i/o resource, the i/o tasks will be dispatched to the previously stopped logical partitions.

It would have been obvious to one of ordinary skill in the art at the time of invention to include the partition control program and associating logic as suggested by Tarui in Day's system thereby the reconfiguration of i/o resources can be done dynamically and in an automatic manner (Tarui's paragraph 84 lines 12-16);

Day does not expressly disclose the claim's aspect of ownership of I/O. However, Tarui further discloses the plurality of logical partitions comprising at least one logical partition that owns identified I/O and at least one logical partition that does not own the identified I/O (Tarui's paragraph 53, space sharing allocation allocates each partition with separate I/O resources; It's further noted that each logical partition can own and process its own identified I/O tasks in separate manner, thus a second logical partition would not process the I/O task that has been assigned, owned and identified by a first logical partition);

Day and Tarui do not expressly disclose the claim's details associating with I/O resources being arranged in I/O loops. However, Kanano discloses a storage subsystem with I/O resources that are arranged including a plurality of I/O towers (Kanano's Fig 2: #11 to #14, paragraphs 27-28) coupled to the apparatus via plurality of I/O loops (Kanano's Fig 2: #211 to #214, and #221 to #224 etc..arrays of disks are arranged in several I/O loops associating with towers Fig 2: #11 to #14, see Kanano's paragraphs 27-28). Kaneko further discloses an I/O reconfiguration mechanism including : detecting when the first I/O loop is unbalanced (Kaneko's

paragraph 38, when a new disk resource being added into the storage subsystem; quiescing I/O resources in the first loop, determining which of the plurality of logical partitions own the I/O resources in the first loop, suspending the logical partitions determined (Kaneko's Fig 4, paragraphs 27-28,35, the requests which are received from the host by any other disk array unit (for example disk array unit 4) that accessing the resources of disk array unit #3 are determined, disconnected and suspended, for example to add a disk in the disk array unit 3); rebalancing the first I/O loop by allocating at least one I/O resource in the first loop from the first logical partition to the second logical partition (Kaneko's paragraph 38 further discloses an embodiment of rebalancing the first I/O loop, by producing a plurality of copies of disk data and dividing them so as to utilize the disk regions connected to the newly installed disk array unit); Obviously after the rebalancing step, the new disk being added is ready for enable the I/O in the first loop after rebalancing; and resuming the logical partitions suspended .

It would have been obvious to one of ordinary skill in the art at the time of invention to include the logical partitioning method and associating logic as suggested by Kaneko in Day's system modified by Tarui, thereby the reconfiguration of i/o resources can be done easily thus further avoid the not intent errors/mistakes when partitioning are reconfiguring I/O resources for a network storage system (see Kaneko's paragraphs 8,6).

Claim 23 is rejected based on the same rational as of claim 22.

As in claim 24, Day discloses a computer readable program product comprising (Day's paragraph 70):

the partition manager managing the plurality of logical partitions and executing separately from the plurality of logical partitions (Day's paragraph 28,37 discloses the partition management code (Fig 2: #203, #202 hypervisor management code and based hyper visor code PLIC) executes separately from logical partition to manage resources in plurality of logical partitions), Day does not expressly disclose the claim's steps associating with the tasks being performed by the partition manager. However, Tarui discloses the partition manager (Tarui's paragraph 59 lines 1-2, partition control program such as hypervisor) comprising:

an I/O reconfiguration mechanism that reconfigures identified I/O (Tarui's paragraph 53 reconfiguring I/O resources that being shared among logical partitions/identified tasks); and a logical partition suspend/resume mechanism that suspends at least one of the plurality of logical partitions before the I/O reconfiguration mechanism reconfigures the identified I/O by inhibiting dispatch of tasks to the at least one logic partition (Tarui's paragraph 84 discloses the partition control program instructs the OS of the current partitions (i.e the partitions whose allocations of resources are being changed, paragraph 83) to stop using the resources, thus obviously no more i/o tasks are issued in these current partitions (i.e corresponding to the claim's suspending logical partition and inhibit dispatch of tasks mechanism to i/o resources, thus quiescing i/o resources associating with the tasks being suspended);

and waiting until all pending tasks in the at least one logical partition are complete (Tarui's Fig 1: #101 discloses pending tasks in logical partition are flushed by the I/O adapter circuitry until it completed, when no more pending I/O request and byte counter value is zero, see Tarui's paragraphs 65, 67), and that resumes all suspended logical partitions after the I/O reconfiguration mechanism reconfigures the identified I/O by enable dispatching of tasks to the

at least one logical partition (Tarui's paragraph 83 and 84 clearly teaches that after reconfiguration of i/o resources, the partitions are permitted/resumed to use the i/o resources, see Tarui's paragraph 84 lines 11-16), obviously when the partitions are permitted to use the i/o resource, the i/o tasks will be dispatched to the previously stopped logical partitions.

It would have been obvious to one of ordinary skill in the art at the time of invention to include the partition control program and associating logic as suggested by Tarui in Day's system thereby the reconfiguration of i/o resources can be done dynamically and in an automatic manner (Tarui's paragraph 84 lines 12-16);

Day does not expressly disclose the claim's aspect of ownership of I/O tasks. However, Tarui further discloses the plurality of logical partitions comprising at least one logical partition that owns identified I/O and at least one logical partition that does not own the identified I/O (Tarui's paragraph 53, space sharing allocation allocates each partition with separate I/O resources; It's further noted that each logical partition can own and process its own identified I/O tasks in separate manner, thus a second logical partition would not process the I/O task that has been assigned, owned and identified by a first logical partition);

Day and Tarui do not expressly disclose the claim's details associating with I/O resources being arranged in I/O loops. However, Kanano discloses a storage subsystem with I/O resources that are arranged including a plurality of I/O towers (Kanano's Fig 2: #11 to #14, paragraphs 27-28) coupled to the apparatus via plurality of I/O loops (Kanano's Fig 2: #211 to #214, and #221 to #224 etc..arrays of disks are arranged in several I/O loops associating with towers Fig 2: #11 to #14, see Kanano's paragraphs 27-28). Kaneko further discloses an I/O reconfiguration mechanism including : detecting when at least one I/O loop is unbalanced

(Kaneko's Fig 2, paragraph 38, when new disk resources being added into the storage subsystem, the new disk resources can be distributed to different users/different logical partitions, see Kaneko's paragraph 12); suspending all of the plurality of logical partitions by inhibiting dispatch of tasks to all of the plurality of logical partitions and waiting until all pending tasks in all of the plurality of logical partitions in all of the plurality of logical partition are completed (In order to provide disk spaces of new disk resources to different users/different logical partitions, all the tasks in all of these different partitions must be further inhibited by inhibiting dispatch of tasks to all of these different partitions, and waiting until the pending tasks are completed; see Kaneko's Fig 4, paragraphs 27-28,35, the requests which are received from the host(s) by any other disk array unit that accessing the I/O resources of disk array units having added I/O resources are determined, disconnected and suspended, for example to add a disk in the disk array unit 3; It's noted that the requests are readily coming from different users/different partitions, see Kaneko's paragraph 12); reconfiguring the I/O loop so the I/O loop is balanced (Kaneko's paragraph 38 further discloses an embodiment of rebalancing the I/O loop(s) with new I/O resources being added, by producing a plurality of copies of disk data and dividing them so as to utilize the disk regions connected to the newly installed disk array unit); Obviously after the configuring/rebalancing step, the new disks being added are ready for usage by enable the dispatch of tasks to all the different users/different partitions and resuming all the different partitions operations.

Response to Arguments

Applicant's arguments regarding rejections of claims 4-5,9-10,16,19 and 22-24 under U.S.C. 103(a) are not persuasive.

A) Claim 1 recites "...the plurality of logical partitions comprising at least one logical partition that owns identified I/O and at least one logical partition that does not own the identified I/O". It's not clear what I/O is, what are components that constitute "I/O" and how "the identifier" is generated. Examiner asks Applicant to point out paragraphs in the specification explains the components constituting "I/O" and how the "I/O" is identified.

Applicant further argues "'As such, the claims clearly recite partitions comprising at least one logical partition that own identified I/O and at least one partition that does not own the same identified I/O. Because a logical partition cannot both own an identified I/O resource and not own the same identified I/O resource, the logical partitions are clearly different logical partition". The argument is disturbing. It is noted that the claim does not recite "an identifier I/O resource", Examiner ask Applicant to point out paragraphs in the specification that equates "identifier I/O" being the same as "identifier I/O resource".

The "I/O" can be interpreted as anything pertains to input or output or both. For example a user A of logical partition A owns an I/O task A1 (I/O task A1 is "identified I/O") and a user B of logical partition B owns another I/O task B1. Of course, partitions A and B are different. And partition B does not own the identified I/O task A1. However, it does not require the two partitions must have separate I/O resources. The two partitions can own and share the same storage disk device (an I/O resource) for their operation.

In other words, the "I/O" and the "I/O resource" are not necessary the same. The "identified I/O" is not necessary the same as the "identified I/O resource". Thus just because the claim requires logical partitions not having the same "identified I/O" . It does not means that the logical partitions must have the same "identified I/O resource".

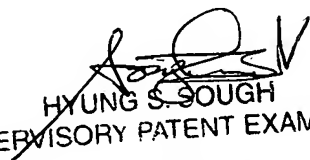
Additionally, claims 23-34 further contradict Applicant's arguments because they recite two separate components in the claims, "the I/O" and "the I/O resources".

Conclusion

When responding to the office action, Applicant is advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Soug can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


HYUNG S. SOUGH
SUPERVISORY PATENT EXAMINER
12/20/07